Food Safety, Nutrition, and Distribution and Climate Change

Summary produced by the Blackfeet Environmental Office
in cooperation with the Center for Large Landscape Conservation

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Climate change is expected to alter the quantity, quality, and locations of the world's food supply. It is expected to decrease the overall amount of food produced as temperatures rise and crop pests increase. Food production will likely decrease most in the tropics as it grows hotter, making farming more difficult. While growing seasons will lengthen closer to the poles, expansion of production there will not compensate for losses in productivity in the tropics. Food nutrient levels are expected to decrease, while contaminant levels in foods could increase.

Disruptions in Food Production, Delivery, and Supply

Weather changes and extreme events can damage and destroy crops and interrupt food transport and delivery, and the problem is expected to be more chronic as the climate changes. Interruptions in food production and delivery at the local, regional, and/or global scales could result in under-nutrition or famine. Food shortages and price volatility are more likely to occur when a nation or region depends primarily on outside food suppliers and when the food supply is concentrated among a just a few suppliers.

Photo by J. Pecora Photography

Climate change is altering the range and abundance of plants and animals. Plants and animals may shift or migrate outside the boundaries of traditional hunting and gathering areas, reducing the availability of first foods like savis berries.

Photo by J. Pecora Photography

Decreasing Nutrient Levels in Food

Increased atmospheric concentrations of carbon dioxide (CO2) are not only a major driver of climate change, but higher CO2 concentrations are stimulating plants to grow faster, reducing the amounts of nutrients, protein, and essential minerals in plants. Already, many people in the US consume less than the recommended amounts of micronutrients like vitamins A, C, D, and E, as well as calcium, and magnesium, as discussed in a study from 2011. Concentrations of zinc, iron, and protein are expected to decrease in staple crops, including wheat, potatoes, rice, maize, and soybean (with the exception of protein in soybean), as shown in recent research. Concentrations of calcium, copper, and magnesium are also expected to decrease, harming human diets.

INCREASED CONTAMINANTS IN FOODS

Photo by J. Pecora Photography

As temperatures rise and there are more extreme weather events, food will have an increased risk for exposing people to pathogens and toxins. Drought can encourage the spread of *Aspergillus flavus*, a mold that produces aflatoxin. Toxic chemical levels in food may increase, as changing climactic conditions increase crop pests and weeds, requiring increased applications of herbicides, fungicides, and insecticides.

Increasingly variable weather and extreme events are predicted to more frequently disrupt food storage and transportation, posing risk of contamination. Heavy rains and snowmelt could increase the concentrations of pathogens in the water supply, increasing the risk of food contamination when the water is used for irrigation. For example, drought conditions can lead to greater risk of exposure to norovirus and *Cryptosporidium.*

Toxic chemicals, such as Mycotoxins, may increase in frequency and range as warm and moist temperatures increase in some places. Mycotoxins are produced by molds that grow on crops before they are harvested and during storage. Though the food supply is typically regulated to prevent exposure, climate change may increase the vulnerability of food safety systems.

With increased water temperatures, fish and mammals may gain higher concentrations of methylmercury. Eating fish could expose people to increasing levels of mercury in their diets.

Glacier Grocery has a selection of fresh fruits and vegetables.

WHO IS MOST AT RISK?

Currently, the area within the Blackfeet Reservation can be considered a "food desert", meaning many residents lack safe and reliable access to affordable fruits, vegetables, whole grains, low-fat milk, and other nutritious foods that comprise a healthy diet. High levels of poverty combined with long distances to grocery stores that carry nutritious foods and challenges with using federal food assistance means that many individuals and households are struggling to have reliable access to healthy foods. These preexisting gaps in food security and food sovereignty make the Blackfeet Nation especially vulnerable to climate change impacts to food.

Climate change will likely impact people's food access differently in the Blackfeet Nation. Older individuals, as well as those living in poverty will be more impacted than higher-income or younger individuals. Pregnant women and their developing babies are especially sensitive to heavy metals and pesticides in foods. Ranch and farm workers and their families are vulnerable to increased chemical exposure when agricultural operations use more pesticides.

HOW CAN WE ADAPT?

- Address existing gaps in food sovereignty and security. A recent report on the gaps with suggestions for increasing food sovereignty and security is found in the 2016 Blackfeet Reservation Community Food Security & Food Sovereignty Assessment by Marissa McElrone. Another way to address gaps is by implementing the Agricultural Resource Management Plan, currently being drafted by Loren BirdRattler and team.
- Diversify food sources and protect and increase access to locally-produced food to help increase resilience in times when there are food shortages at the global level. The Iinnii Initiative (Buffalo Project) offers one way to diversify the food supply, as it has begun supplying elders and traditional ceremonies with buffalo meat sourced from within the Blackfeet Nation.

Photo by Melly Reuling

- Investigate planting crops that could help diversify the local food system, better withstand a hotter and drier climate, and increase access to nutritious foods. For example, growing lentils and other legumes can help restore soil health and provide a highly nutritious food. (One model for this is Timeless Seeds, a small group of farmers that have profited from growing legumes in central Montana.)
- Support educational programming on nutrition and demonstrate ways to select and prepare healthy and affordable meals.
- Support agricultural practices that reduce the amount of pesticides and other chemicals needed to produce crops.
- Protect rights and access to traditional hunting and gathering areas. Find ways to access traditional foods and resources outside of traditional areas to help protect local sources of nutritious food. Areas of access may need to be expanded as climate change alters the distribution of traditional food sources.
- Give careful consideration before diverting staple crops to become biofuel feedstock.
- Plan ahead to maintain food supply and distribution systems in the event of extreme weather events.
- Advise people about risks of mercury levels in fish and shellfish, particularly pregnant women.
- Examine food handling practices and ensure that food is handled safely to help guard against people consuming contaminated foods.

For more information, visit the Blackfeet Country and Climate Change website:

blackfeetclimatechange.com

Content on this page is summarized from the U.S. Global Change Research Program's report, "The Impacts of Climate Change on Human Health in the United States", the National Institute of Environmental Health Sciences' "A Human Health Perspective on Climate Change", and the Centers for Disease Control and Prevention's "When Every Drop Counts" to briefly describe some of the possible health outcomes that are most relevant to Blackfeet Country. This page does not include all possible health impacts and outcomes, nor does it include all possible risks and responses. It is important to keep in mind that our decisions and actions can influence the degree to which our community will experience these impacts to our health. Being proactive and making decisions now to safeguard health will help us be more resilient. (December, 2017)